

ii) sufficient thermal insulating means under one of its surfaces to overcome heat sinking when the voltmeter is in contact with a battery having an electrically conductive housing and 2) the voltmeter includes means for forming an electrical switch with the electrically conductive battery housing.

-55-

A label comprising an integral battery voltmeter having a plurality of layers in the following order:

- A) a dielectric layer;
- B) a conductive layer;
- C) one or more substrate layers for the label;
- D) a temperature sensitive color indicator

layer; and characterized in that 1) the conductive layer has i) sufficient heat generating capacity to effect a change in the temperature sensitive color indicator layer and ii) sufficient thermal insulating means under one of its surfaces to overcome heat sinking when the voltmeter is in contact with a battery having an electrically conducting housing and 2) the voltmeter includes means for forming an electrical switch with the electrically conductive battery housing.

-56-

The label of claim 54 wherein the dielectric layer also serves as the label.

-57-

The label of claim 55 wherein one or more layers are included for labeling purposes between the conductive layer and the color indicator layer.

-58-

A label according to claim 57 wherein one or both ends of the conductive layer extends beyond one or both edges of the label.

-59-

A label according to claim 54 or 55 wherein one or both ends of the conductive layer are in registration with holes in the dielectric layer.

-60-

A label according to any one of claims 54 or 55 wherein a graphics layer having a scale calibrated for voltage or current is included below or alongside the color indicator layer.

-61-

A label according to claim 54 or 55 wherein the temperature insulating means is formed by placing a temperature insulating material under the conductive layer.

-62-

A battery having a label with an integral voltmeter; wherein the voltmeter comprises:

- A) a dielectric layer;
- B) a conductive layer above or below the dielectric layer; and

B' cont'd.

C) a temperature sensitive color indicator layer in thermal contact with the conductive layer, characterized in that 1) the conductive layer has i) sufficient heat generating capacity to affect a change in the temperature sensitive color indicator layer and ii) sufficient thermal insulating means under one of its surfaces to overcome heat sinking when the voltmeter is in contact with a battery having an electrically conducting housing and 2) the voltmeter includes means for forming an electrical switch with the electrically conductive battery housing.

-63-

A battery having a label with an integral voltmeter; wherein the voltmeter comprises a plurality of layers in the following order:

- A) a dielectric layer;
- B) a conductive layer;
- C) one or more substrate layers for the label; and

D) a temperature sensitive color indicator layer, characterized in that 1) the conductive layer has i) sufficient heat generating capacity to affect a change in the temperature sensitive color indicator layer and ii) sufficient thermal insulating means under one of its surfaces to overcome heat sinking when the voltmeter is in contact with a battery having an electrically conducting

housing and 2) the voltmeter includes means for forming an electrical switch with the electrically conductive battery housing.

-64-

The battery of claim 62 wherein the dielectric layer also serves as the label.

-65-

The battery of claim 63 wherein one or more layers are included for labeling purposes between the conductive layer and the color indicator layer.

-66-

A battery according to claim 62 or 63 wherein the ends of the conductive layer are each of sufficient length to make electrical contact with each battery electrode.

-67-

A battery according to claim 62 or 63 wherein one or both terminals of the conductive layers are in registration with different holes in the dielectric layer thereby forming membrane electrical switches for activating the voltmeter.

-68-

A battery according to claim 62 or 63 wherein one end the conductive layer is in electrical contact with one electrode of the battery and the other end has tab that extends above or below one of the edges of the label sufficiently to engage the other battery electrode thereby forming an electrical switch.

B' cont'd.